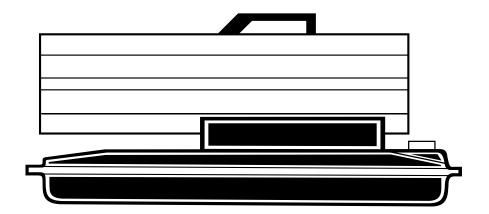
PORTABLE FORCED AIR HEATER OWNER'S MANUAL



Models: B50H and REM50C Heater Size: 50,000 Btu/Hr

IMPORTANT

Read and understand this manual before assembling, starting, or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.



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SAFETY INFORMATION

AWARNINGS

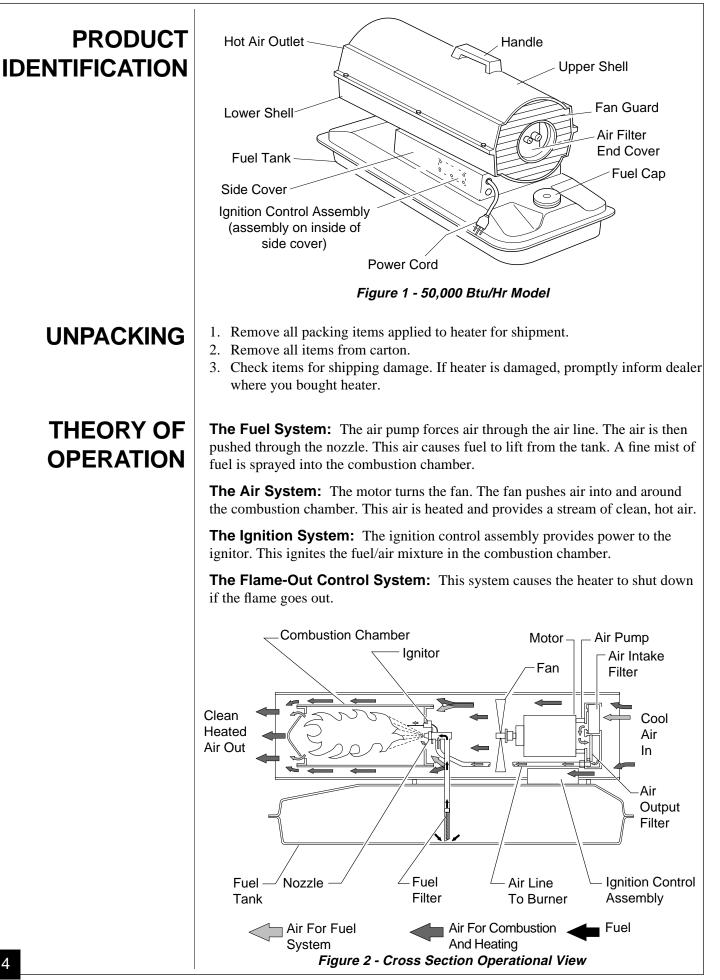
IMPORTANT: Read this Owner's Manual carefully and completely before trying to assemble, operate, or service this heater. Improper use of this heater can cause serious injury or death from burns, fire, explosion, electrical shock, and carbon monoxide poisoning.

Carbon monoxide poisoning may lead to death!

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

Make certain you read and understand all Warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

SAFETY	WARNINGS (Continued)
INFORMATION Continued	 Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels. Evaling
Commued	 Fueling Personnel involved with fueling shall be qualified and thoroughly familiar with the manufacturer's instructions and applicable federal, state, and local regulations regarding the safe fueling of heating units. Only the type of fuel specified on the heater's data plate shall be used. All flame, including the pilot light, if any, shall be extinguished and the heater allowed to cool, prior to fueling. During fueling, all fuel lines and fuel-line connections shall be inspected for leaks. Any leaks shall be repaired prior to returning the heater to service. At no time shall more than one day's supply of heater fuel be stored inside a building in the vicinity of the heater. Bulk fuel storage shall be outside the structure. All fuel storage shall be located a minimum of 25 feet from heaters, torches, welding equipment, and similar sources of ignition (exception: the fuel reservoir integral with the heater unit). Whenever possible, fuel storage shall be confined to areas where floor penetra-
	tions do not permit fuel to drip onto or be ignited by a fire at lower elevation.h) Fuel storage shall be in accordance with the federal, state, or local authority having jurisdiction.
	• Never use heater where gasoline, paint thinner, or other highly flammable vapors are present.
	• Follow all local ordinances and codes when using heater.
	• Heaters used in the vicinity of tarpaulins, canvas, or similar enclosure materials shall be located a safe distance from such materials. The recommended minimum safe distance is 10 feet. It is further recommended that these enclosure materials be of a fire retardant nature. These enclosure materials shall be securely fastened to prevent them from igniting or from upsetting the heater due to wind action.
	• Use only in well-vented areas. Before using heater, provide at least a three-square- foot opening of fresh, outside air for each 100,000 Btu/Hr of rating. This heater produces carbon monoxide, which is listed by the State of California as a reproductive toxin under Proposition 65.
	• Use only in places free of flammable vapors or high dust content.
	• Use only the electrical voltage and frequency specified on model plate.
	• Use only a three-prong, grounded extension cord.
	• Minimum heater clearances from combustibles:
	Outlet: 8 Ft. Sides: 4 Ft. Top: 4 Ft. Rear: 4 Ft.
	• Locate heater on a stable and level surface if heater is hot or running or a fire may occur.
	• When moving or storing heater, keep heater in a level position or fuel spillage may occur.
	• Keep children and animals away from heater.
	• Unplug heater when not in use.
	• When used with thermostat, heater may start anytime.
	• Never use heater in living or sleeping areas.
	• Never block air inlet (rear) or air outlet (front) of heater.
	• Never move, handle, refuel, or service a hot, operating, or plugged-in heater.
	• Never attach duct work to front or rear of heater.



FUELS

Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.

Do not use heavy fuels such as No. 2 fuel oil or No. 2 Diesel. Using heavy fuels will result in:

• clogged fuel filter and nozzle

• the need of non-toxic anti-icer in fuel during very cold weather

IMPORTANT: Use a KEROSENE ONLY storage container. Be sure storage container is clean. Foreign matter such as rust, dirt, or water will cause the ignition control assembly to shut down the heater. Foreign matter may also require you to clean fuel system often.

VENTILATION

OPERATION

WARNING

Follow the minimum fresh, outside air ventilation requirements. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.

Provide at least a two-square-foot opening of fresh, outside air for each 50,000 Btu/Hr rating. Provide extra fresh air if more heaters are being used. *Example:* A 50,000 Btu/Hr heater requires one of the following:

- a 16 foot two-car garage door raised two inches
- a 9 foot single-car garage door raised three inches
- two, thirty-inch windows raised five inches

Review and understand the warnings in the Safety Information Section, pages 2 and 3. They are needed to safely operate this heater. Follow all local codes when using this heater.

To Start Heater

- 1. Follow all ventilation and safety information.
- 2. Fill fuel tank with kerosene or No. 1 fuel oil.
- 3. Attach fuel cap.
- 4. Plug power cord of heater into three-prong, grounded extension cord. Extension cord must be at least six feet long.

Extension Cord Wire Size Requirements 6 to 10 feet long, use 18 AWG rated cord

- 11 to 100 feet long, use 16 AWG rated cord
- 101 to 200 feet long, use 14 AWG rated cord
- 5. Plug extension cord into standard 120 volt/60 hertz, three-hole, grounded outlet. *Note:* Ignitor will preheat for five seconds then heater will start.

To Stop Heater

1. Unplug extension cord from outlet.

To Restart Heater

- 1. Wait ten seconds after stopping heater.
- 2. Repeat steps under *To Start Heater* (see above).

STORING, TRANSPORTING, OR SHIPPING

Note: If shipping, transport companies require fuel tanks to be empty.

- 1. Drain fuel tank. Drain fuel through fuel cap opening. Be sure all fuel is removed.
- 2. If any debris is noted in old fuel, add 1 or 2 quarts of clean kerosene to tank, stir, and drain again. This will prevent excess debris from clogging filters during future use.
- 3. Replace fuel cap. Properly dispose of old and dirty fuel. Check with local automotive service stations that recycle oil.
- 4. If storing, store heater in dry place. Make sure storage place is free of dust and corrosive fumes.

IMPORTANT: Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

PREVENTATIVE MAINTENANCE SCHEDULE

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

<u>How Often</u>	<u>How To</u>
Flush every 150-200 hours of operation or as needed.	See Storing, Transporting, or Shipping, above.
Replace every 500 hours of operation or once a year.	See Air Output, Air Intake, and Lint Filters, page 8.
Wash and dry with soap and water every 500 hours of op- eration or replace as needed.	See Air Output, Air Intake, and Lint Filters, page 8.
Clean twice a heating season or replace as needed.	See Fuel Filter, page 9.
No maintenance required.	
Clean each season or as needed.	See Fan, page 8.
Not required/permanently lubrica	ated
	 Flush every 150-200 hours of operation or as needed. Replace every 500 hours of operation or once a year. Wash and dry with soap and water every 500 hours of op- eration or replace as needed. Clean twice a heating season or replace as needed. No maintenance required. Clean each season or as needed.

TROUBLE-SHOOTING

WARNING

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

		DEMEDY		
FAULT CONDITION	POSSIBLE CAUSE	<u>REMEDY</u>		
Motor does not start five seconds after	No power to heater	Check circuit breaker in electrical panel.		
heater is plugged in.	Bad electrical connection between motor and ignition control assembly or ignition assembly and power cord	Check all electrical connections. See Wiring Diagram page 11.If fan does not turn freely, se Pump Rotor, page 10.		
	Binding pump rotor			
	Defective ignition control assembly	Replace ignition control assembly.		
	Defective motor	Replace motor.		
Motor starts and runs	No fuel in tank	Fill tank with kerosene.		
but heater does not ignite.	Pump pressure incorrect See <i>Pump Pressure</i> <i>ment</i> , pages 9.			
	Dirty fuel filter	See Fuel Filter, page 9.		
	Obstruction in nozzle	See Nozzle, page 10.		
_	Water in fuel tank Drain and flush fuel ta clean kerosene. See <i>Transporting, or Ship</i> page 6.			
	WARNING: High voltage	!		
	Bad electrical connection between ignitor and ignition control assembly	Check electrical connections. See <i>Wiring Diagram</i> , page 1		
	Defective ignitor	Replace ignitor.		
	Defective ignition control assembly	Replace ignition control assembly.		
Heater ignites but ignition control assembly	Pump pressure incorrect	See Pump Pressure Adjust- ment, page 9.		
shuts heater off after a short period of time.	Dirty air intake, air output, and/or lint filter	See Air Output, Air Intake, and Lint Filters, page 8.		
	Dirty fuel filter	See Fuel Filter, page 9.		
	Obstruction in nozzle	See Nozzle, page 10.		
	Photocell assembly not properly installed (not seeing the flame)			
	Dirty photocell lens	Clean photocell lens.		
	Bad electrical connection between photocell and ignition control assembly	Check electrical connections. See Wiring Diagram, page 1		
	Defective photocell	Replace photocell.		
	Defective ignition control	Replace ignition control		

SERVICE PROCEDURES

Upper Shell Removal

- 1. Remove screws along each side of heater using 5/16" nut-driver. These screws attach upper and lower shells together.
- 2. Lift upper shell off.
- 3. Remove fan guard.

Fan

IMPORTANT: Remove fan from motor shaft before removing motor from heater. The weight of the motor resting on the fan could damage the fan pitch.

- 1. Remove upper shell (see above).
- 2. Use 1/8" allen wrench to loosen set-screw which holds fan to motor shaft.
- 3. Slip fan off motor shaft.
- 4. Clean fan using soft cloth moistened with kerosene or solvent.
- 5. Dry fan thoroughly.
- 6. Replace fan on motor shaft. Place fan hub flush with end of motor shaft (see Figure 4).
- 7. Place setscrew on flat of shaft. Tighten setscrew firmly (40-50 inch-pounds).
- 8. Replace fan guard and upper shell.

Air Output, Air Intake, and Lint Filters

- 1. Remove upper shell (see above).
- Remove apper sheri (see above).
 Remove filter end cover screws using 5/16" nut-driver.
- 3. Remove filter end cover.
- 4. Replace air output and lint filters.
- 5. Wash or replace air intake filter (see *Preventative Maintenance Schedule*, page 6).
- 6. Replace filter end cover.
- 7. Replace fan guard and upper shell.

IMPORTANT: Do not oil filters.

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

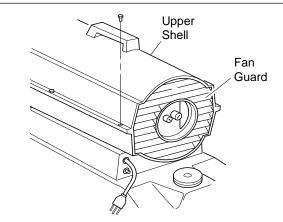


Figure 3 - Upper Shell Removal

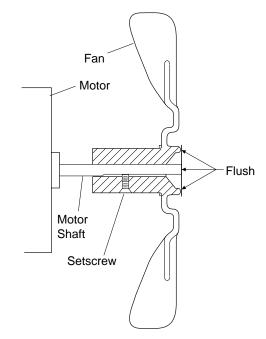
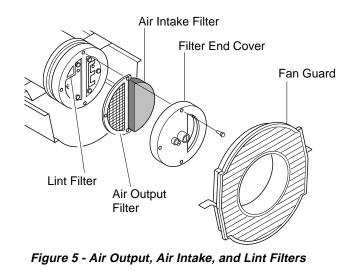


Figure 4 - Fan Cross Section



Pump Pressure Adjustment

- 1. Remove pressure gauge plug from filter end cover.
- 2. Install accessory pressure gauge (part number HA1180).
- 3. Start heater (see *Operation*, page 5). Allow motor to reach full speed.
- 4. Using a flat blade screwdriver, set the pressure to 3.6 PSI. Turn relief valve to right to increase the pressure. Turn relief valve to left to decrease the pressure.
- 5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.

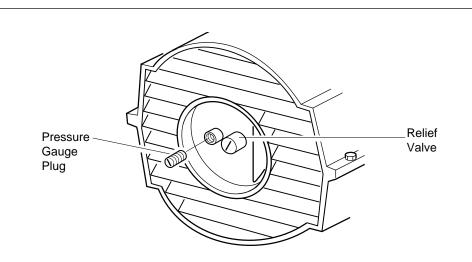


Figure 6 - Pressure Gauge Plug Removal

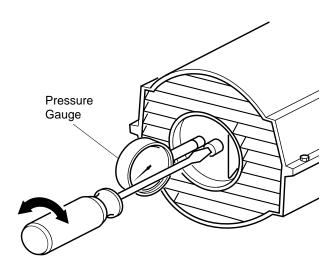


Figure 7 - Adjusting Pump Pressure

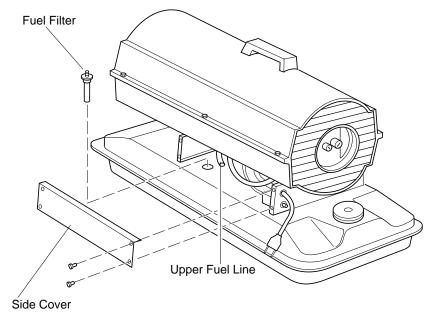


Figure 8 - Fuel Filter Removal

Fuel Filter

- 1. Remove 4 side cover screws using 5/16" nut-driver.
- 2. Remove side cover.
- 3. Pull upper fuel line off fuel filter neck.
- 4. Carefully pry bushing and fuel filter out of fuel tank.
- 5. Wash fuel filter with clean fuel and replace in tank.
- 6. Attach upper fuel line to fuel filter neck.
- 7. Replace side cover.

Nozzle

- 1. Remove upper shell (see page 8).
- 2. Remove fan (see page 8).
- 3. Remove fuel and air line hoses from nozzle assembly.
- 4. Turn nozzle assembly 1/4 turn to left and pull toward motor to remove.
- 5. Place plastic hex-body into vise and lightly tighten.
- 6. Carefully remove nozzle from the nozzle adapter using 5/8" socket wrench.
- Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
- 8. Inspect nozzle seal for damage.
- Replace nozzle into nozzle adapter until nozzle seats. Tighten 1/3 turn more using 5/8" socket wrench (40-45 inch-pounds).
- 10. Attach nozzle assembly to burner strap.
- 11. Attach fuel and airline hoses to nozzle assembly.
- 12. Replace fan (see page 8).
- 13. Replace fan guard and upper shell.

Pump Rotor

(Procedure if rotor is binding)

- 1. Remove upper shell (see page 8).
- 2. Remove filter end cover screws using 5/16" nut-driver.
- 3. Remove filter end cover and air filters.
- Remove pump plate screws using 5/16" nut-driver.
- 5. Remove pump plate.
- 6. Remove rotor, insert, and blades.
- 7. Check for debris in pump. If debris is found, blow out with compressed air.
- 8. Install insert and rotor.
- Check gap on rotor. Adjust to .003"/.004" if needed (see Figure 13).

Note: Rotate rotor one full turn to insure the gap is .003"/.004" at tightest position. Adjust if needed.

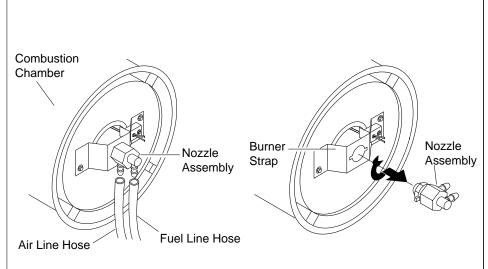
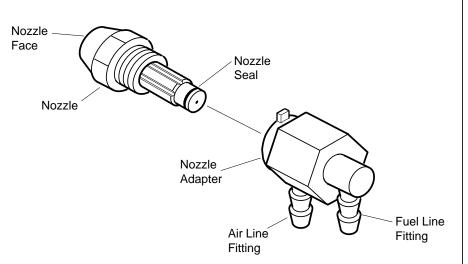
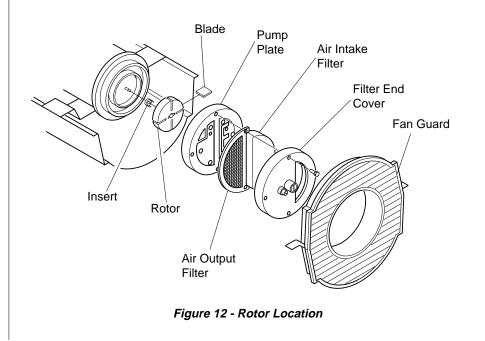


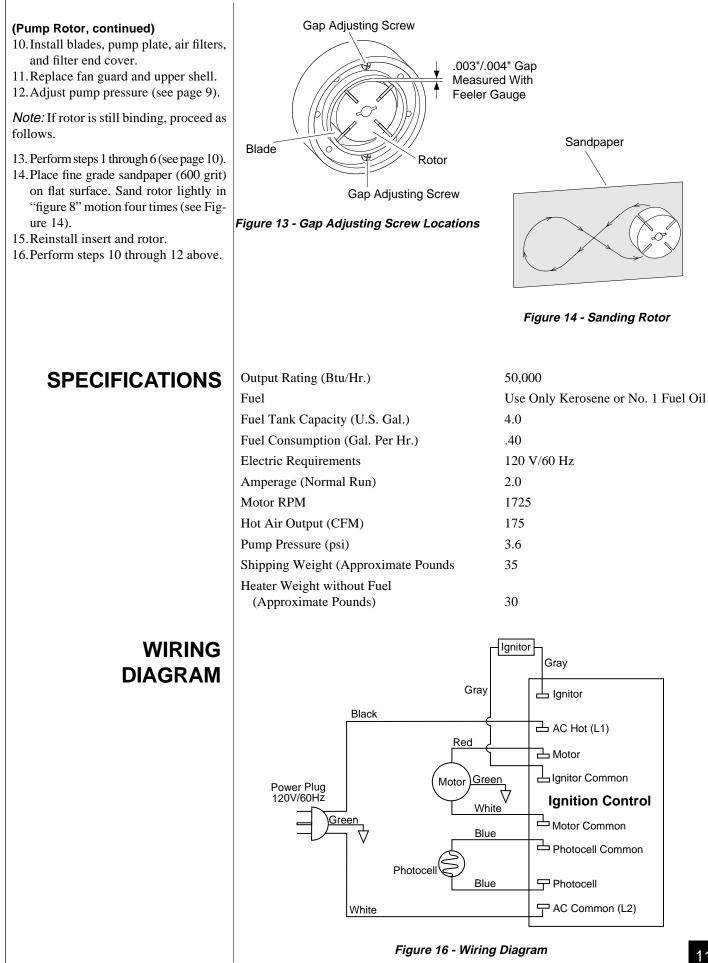
Figure 9 - Removing Air and Fuel Line Figure 10 - Removing Nozzle Assembly Hoses







Continued



TECHNICAL SERVICE

You may have further questions about operation or troubleshooting. If so, contact DESA International's Technical Service Dept. at 1-800-323-5190.

REPLACEMENT PARTS

Note: Use only original replacement parts. This will protect your warranty coverage for parts replaced under warranty.

Parts Under Warranty

Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA International's Technical Service Dept. at 1-800-323-5190.

When calling DESA International, have ready

- your name
- your address
- model number of your heater
- how heater was malfunctioning
- purchase date

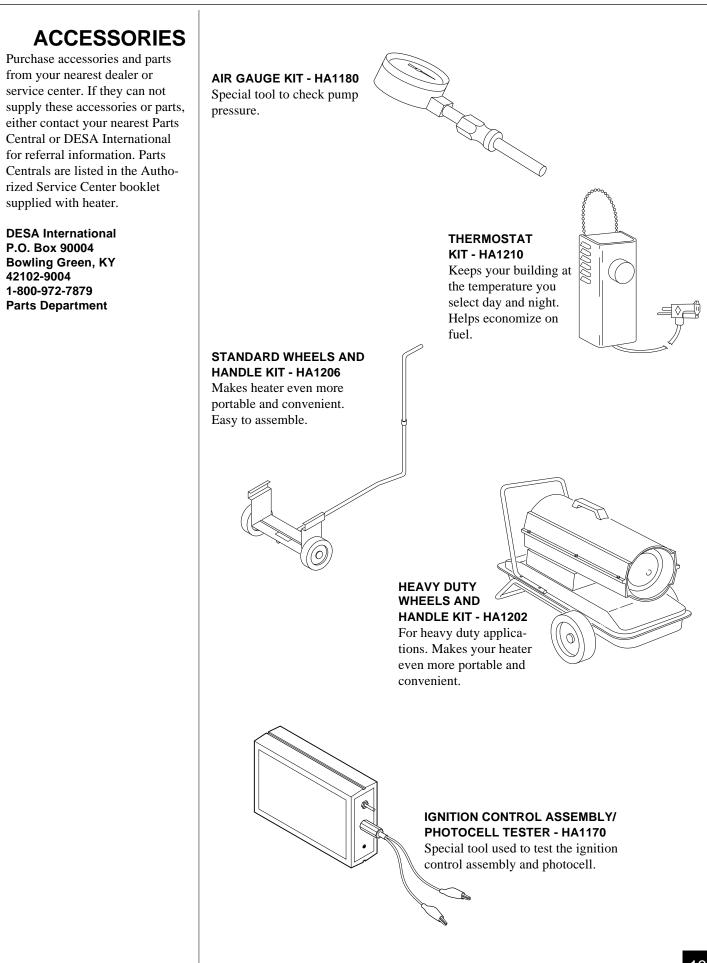
Usually, we will ask you to return the defective part to the factory.

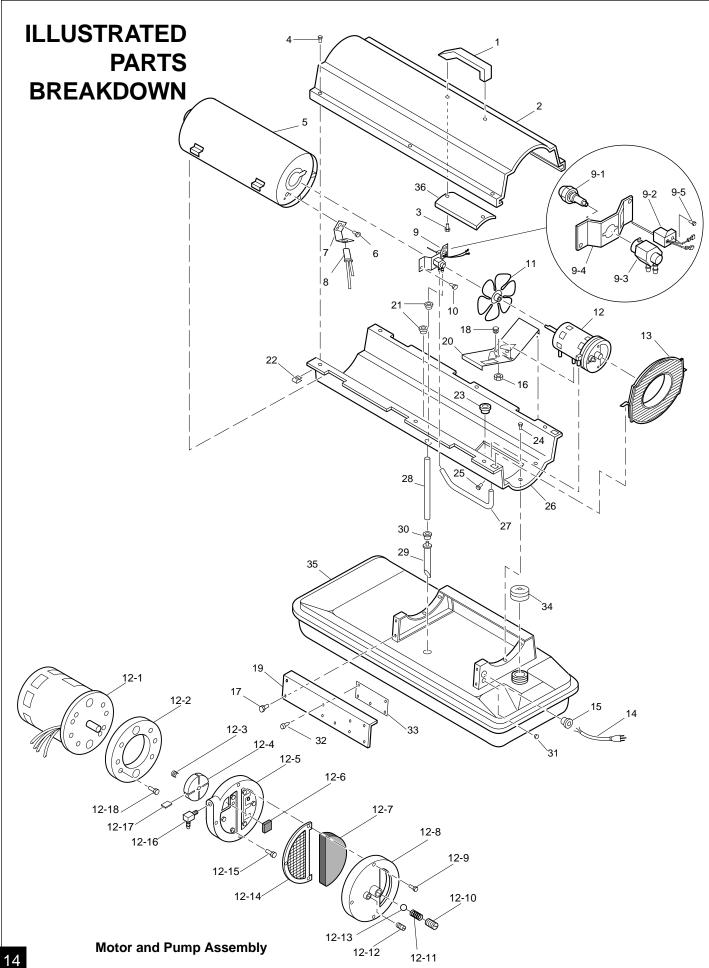
Parts Not Under Warranty

Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA International's Parts Dept. at 1-800-972-7879 for referral information.

When calling DESA International, have ready

- model number of your heater
- the replacement part number





PARTS LIST Models B50H and REM50C

This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and serial numbers (from the model plate), then the part number and description of the desired part.

KEY NO.	PART NUMBER	DESCRIPTION	QTY.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	M51104-01	Handle	1	18	M50631	Rubber Bumper	2
2	098511-54	Upper Shell (B50H)	1	19	097461-03AA	Side Cover	1
	098511-67	Upper Shell (REM50C)	1	20	101205-01	Motor Bracket	1
3	M11084-29	Screw, #10-16 x 3/4"	2	21	M30865-02	Bushing	2
4	100647-01	Screw, #10-16 x 1/2"	6	22	M11271-8	Clip Nut	6
5	098512-39	Combustion Chamber	1	23	M50104-02	Bushing	1
6	M10908-2	Screw, #6-32 x 3/8"	2	24	M11084-26	Screw, #10-16 x 3/8"	6
7	M16660	Photocell Bracket	1	25	M10908-12	Screw, #8-32 x 3/8"	1
8	M16656-23	Photocell Assembly	1	26	098511-12	Lower Shell (B50H)	1
9	***	Burner Head Assembly	1		098511-81	Lower Shell (REM50C)	1
9-1	HA3021	Nozzle	1	27	M29652-04	Rubber Airline	1
9-2	102548-01	Ignitor Kit	1	28	079973-01	Fuel Line	1
9-3	079980-01	Nozzle Adapter	1	29	M50876-02	Fuel Filter (With Bushing)	1
9-4	102336-01	Bracket	1	30	M10990-3	Rubber Bushing	1
9-5	M11084-42	Screw, #6-20 x 3/4"	1	31	101695-01	Button Plug	1
10	M11084-26	Screw, #10-16 x 3/8"	2	32	102349-01	PCB Support	1
11	M30884	Fan	1	33	102350-01	Ignition Control Assembly	1
12	***	Motor and Pump Assembly	1	34	097702-01	Fuel Cap (Includes Gasket)	1
12-1	102001-01	Motor	1	35	098513-27	Fuel Tank (B50H)	1
12-2	100422-02	Pump Body	1		098513-20	Fuel Tank (REM50C)	1
12-3	M22009**	Insert	1	36	M51108-01	Heat-Shell Shield	1
12-4	M22456-2**	Rotor	1	PARTS AVAILABLE - NOT SHOWN			
12-5	M29608	Pump End Cover	1		097646-01 Tradename Decal (B50H)		
12-6	M29632**	Lint Filter	1		097764-02	Tradename Decal (REM50C)	
12-7	M29633**	Intake Filter	1		101685-09 General Information Decal (B50H)		
12-8	M29609	Filter End Cover	1	101685-10 General Information Decal (REM50C		,	
12-9	M12461-31	Screw, #10-32 x 1"	3	M51017-01 Cushion Grommet (B50H)		,	
12-10	M27694**	Adjusting Screw	1	OPTIONAL ACCESSORIES			
12-11	M10993-1**	Pressure Relief Spring	1				
12-12	M22997**	Plug Steel Ball, 1/4" diameter	1		HA1202	Hang-up Thermostat	
12-13	M8940**	,	1		HA1202	Heavy Duty Wheels and Handle Kit Standard Wheels and Handle Kit	
12-14	M29612-01**	Output Filter	1		HA1200	Standard Wheels and Handle Kit	
12-15		Screw, #10-32 x 1 1/8"	6		HA2210	Fuel Tank Filter Screen	
12-16	M50016	Elbow, 90°	1		HA3005		
12-17	M8643-2**	Blade	4		1173003	Rotor Kit (M22456-2, M22009, M8643-2)	
12-18 13	FHPF3-6C M51105-01	Screw, #10-32 x 3/4" Fan Guard	2		HA3014	Filter Kit (M29632, M29633,	
	M51105-01					M29612-01)	
14	098219-31	Power Cord	1		HA3020	Pump Kit (M27694, M10993-1,	
15	M11143-1	Strain Relief Bushing	1			M22997, M8940)	
16 17	NTC-4C M11084-26	Hex Lock Nut, 1/4-20 Screw, #10-16 x 3/8"	2 4		HA1170	Ignition Control Assembly/Photocell Tester	

** Not available as an assembly. *** See OPTIONAL ACCESSORIES

WARRANTY AND REPAIR SERVICE

LIMITED WARRANTY

DESA International warrants this product and any parts thereof, to be free from defects in materials and workmanship for six (6) months from the date of first purchase when operated and maintained in accordance with instructions. This warranty is extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, normal wear, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EX-PRESSED OR IMPLIED, INCLUDING WARRAN-TIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DESA International assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA International will repair or replace the heater without charge.

REPAIR SERVICE

Return the heater to your nearest authorized service center. Repairs not covered by the warranty will be billed at standard prices.

Illustrated parts lists can be obtained free of charge. Send a self addressed stamped envelope to the address listed below. List the heater model number and the date located in the lower right corner of this page. A service manual may be purchased from the address listed below. Send a check for \$5.00 payable to DESA International.

When writing for information regarding your heater, be sure to include the model number and serial number as shown on the model plate.

Each Service Center is independently owned and operated. We reserve the right to amend these specifications at any time without notice.

KEEP THIS WARRANTY

Model No.

Serial No. _

Date of Purchase _

(To be filled in by purchaser)



2701 Industrial Drive P.O. Box 90004 Bowling Green, KY 42102-9004

For information, write: DESA International, P.O. Box 90004 Bowling Green, Kentucky 42102-9004 ATTN: Customer Service Department When writing, always include model number and serial number.

102553-01 Rev. B 11/95